

Listing of the Claims

Please amend the claims as follows:

1. (Original) An antimicrobial polymeric compound having formula (1):



P comprises a polymer linked to X via a carboxyl group;

X comprises a group $-(R-V^{m+}-R^1-R^2)_q(Y^p)-$;

n is an integer of $1-1 \times 10^7$;

R is independently selected from divalent hydrocarbon radicals;

V comprises a positively charged moiety;

m represents an integer;

R^1 is independently selected from divalent hydrocarbon radicals;

R^2 is independently selected from the group consisting of $-H$, $-SH$, $-F$, $-Cl$, $-Br$, $-I$, $-OR^3$, $-HN(O)CR^4$, or $-O(O)CR^5$, wherein R^3 , R^4 and R^5 are independently selected from the group consisting of $-H$ and monovalent hydrocarbon radicals;

Y represents an anion;

q represents m/p; and,

p represents an integer;

or a pharmaceutically acceptable derivative of a compound of formula (1).

2. (Original) A compound according to claim 1, wherein P is a carboxyl group-containing polysaccharide.

3. (Currently amended) A compound according to claim 2, wherein the polysaccharide is selected from the group consisting of carboxyl group-containing celluloses, modified starches, chitosans, guar gums, glycans, galactans, glucans, xanthan gums, alginic acids, polymannuric acids, hyaluronic acids, polyglycosuronic and polyguluronic acids, mannans, dextrans, cyclodextrins, and mixtures thereof, gellans, succinoglycans, pectins, chondroitin sulphate, heparan sulphates, dermatans, as well as other synthetically carboxylated polysaccharides, and of naturally occurring carboxylated polysaccharides, which may be linear

or branched, ~~preferably hyaluronic acid, gellan, xanthan, succinoglycan, pectin, chondroitin sulphate, heparan sulphate, dermatan, more preferably alginic acid and hyaluronic acid, particularly alginic acid.~~

4. (Original) A compound according to claim 1, wherein the polymer comprises a synthetic polymer obtainable by homo- or co-polymerisation of a monomer selected from the group consisting of (meth)acrylic acid, methyl (meth)acrylate, ethyl (meth)acrylate, n-propyl (meth)acrylate, isopropyl (meth)acrylate, n-butyl (meth)acrylate, isobutyl (meth)acrylate, tert-butyl (meth)acrylate, n-pentyl (meth)acrylate, n-hexyl (meth)acrylate, cyclohexyl (meth)acrylate, n-heptyl (meth)acrylate, n-octyl (meth)acrylate, 2-ethylhexyl (meth)acrylate, nonyl (meth)acrylate, decyl (meth)acrylate, dodecyl (meth)acrylate, phenyl (meth)acrylate, toluoyl (meth)acrylate, benzyl (meth)acrylate, 2-methoxyethyl (meth)acrylate, 3-methoxybutyl (meth)acrylate, 2-hydroxyethyl (meth)acrylate, 2-hydroxypropyl (meth)acrylate, stearyl (meth)acrylate, glycidyl (meth)acrylate, 2-aminoethyl (meth)acrylate, (meth)acrylic acid-ethylene oxide adducts, trifluoromethylmethyl (meth)acrylate, 2-trifluoromethylethyl (meth)acrylate, 2-perfluoroethylethyl (meth)acrylate, 2-perfluoroethyl-2 perfluorobutylethyl (meth)acrylate, 2-perfluoroethyl (meth)acrylate, perfluoromethyl (meth)acrylate, diperfluoromethylmethyl (meth)acrylate, 2-perfluoromethyl-2-perfluoroethylmethyl (meth)acrylate, 2-perfluorohexylethyl (meth)acrylate, 2-perfluorodecylethyl (meth)acrylate, 2-perfluorohexadecylethyl (meth)acrylate and mixtures thereof.

5. (Currently amended) A compound according to claim 1, wherein the polymer P comprises $10-1 \times 10^7$ monomeric units, ~~more preferably $20-1 \times 10^6$, more preferably $30-1 \times 10^5$, more preferably $40-1 \times 10^4$ most preferably greater than 1000 monomeric units.~~

6. (Previously presented) The compound according to claim 1, wherein R^2 is -H.

7. (Currently amended) The compound according to claim 6, wherein R is selected from the group consisting of C_{1-20} alkanediyl, C_{2-20} alkenediyl, C_{2-20} alkynediyl, C_{3-30}

cycloalkanediyl, C₃₋₃₀ cycloalkenediyl, C₅₋₃₀ cycloalkynediyl, C₇₋₃₀ aralkylenediyl, C₇₋₃₀ alkarylenediyl and C₅₋₃₀ arylenediyl, ~~preferably selected from the group consisting of C₁₋₁₆ alkanediyl, C₂₋₁₆ alkenediyl, C₂₋₁₆ alkynediyl, C₄₋₂₀ cycloalkanediyl, C₄₋₂₀ cycloalkenediyl, C₅₋₂₀ cycloalkynediyl, C₇₋₂₀ aralkylenediyl, C₇₋₂₀ alkarylenediyl and C₆₋₂₀ arylenediyl, more preferably selected from the group consisting of straight chain C₁₋₁₆ alkanediyl, C₂₋₁₆ alkenediyl, C₆₋₁₆ aralkylenediyl and C₆₋₁₆ alkarylenediyl, most preferably, R is selected from methylene, 1,2-ethylene, 1,2-propylene, 1,3-propylene, 1,2-butylene, 1,3-butylene, 1,4-butylene, 1,5-pentylene, 1,6-hexylene, 1,8-octylene, 1,10-decylene and 1,12-dodecylene.~~

8. (Previously presented) The compound according to claim 7, wherein substantially all groups R are the same.

9. (Previously presented) The compound according to claim 7, wherein R represents a mixture of hydrocarbon chains.

10. (Currently amended) The compound according to claim 7, wherein R¹ is selected from the group consisting of C₁₋₃₀ alkanediyl, C₂₋₃₀ alkenediyl, C₂₋₃₀ alkynediyl, C₃₋₃₅ cycloalkanediyl, C₃₋₃₅ cycloalkenediyl, C₅₋₃₅ cycloalkynediyl, C₇₋₃₅ aralkylenediyl, C₇₋₃₅ alkarylenediyl and C₅₋₃₅ arylenediyl, ~~preferably selected from the group consisting of C₁₋₁₈ alkanediyl, C₂₋₁₈ alkenediyl, C₂₋₁₈ alkynediyl, C₄₋₂₀ cycloalkanediyl, C₄₋₂₀ cycloalkenediyl, C₅₋₂₀ cycloalkynediyl, C₇₋₂₀ aralkylenediyl, C₇₋₂₀ alkarylenediyl and C₆₋₂₀ arylenediyl, more preferably selected from the group consisting of straight chain C₁₋₁₅ alkanediyl, C₂₋₁₅ alkenediyl, C₆₋₁₅ aralkylenediyl and C₆₋₁₅ alkarylenediyl, most preferably, R¹ is selected from 1,6-hexylene, 1,8-octylene, 1,10-decylene and 1,12-dodecylene.~~

11. (Previously presented) The compound according to claim 10, wherein R¹ comprises a mixture of hydrocarbon chains.

12. (Previously presented) A compound according to claim 11, wherein at least some of the hydrocarbon chains R¹ in the mixture have 12-18 carbon atoms.

13. (Previously presented) A compound according to claim 11, wherein R¹ has greater than 10 carbon atoms in the chain.

14. (Currently amended) The compound according to claim 10, preferably wherein m is 1, 2 or 3.

15. (Currently amended) A compound according to claim 14, wherein m is 1 or 2.

16. (Previously presented) The compound according to claim 14, wherein p is 1, 2, 3, 4, 5 or 6.

17. (Previously presented) The compound according to claim 16, wherein Y represents one or more anions that balance the charge of positively charged moiety V.

18. (Previously presented) The compound according to claim 17, wherein Y is selected from the group consisting of N-hydroxysuccinimidyl, N-hydroxybenzotriazolyl, nitrate, sulfate, bisulfate, phosphate (mono-, bi-, or triphosphate), carbonate, bicarbonate, acetate, tosylates, mesylates, brosylates, and halides including chloride, bromide, and iodide and mixtures thereof.

19. (Currently amended) The compound according to claim 18, wherein R³, R⁴ and R⁵ are independently selected from the group consisting of --H, C₁₋₂₀ alkyl, C₂₋₂₀ alkenyl, C₂₋₂₀ alkynyl, C₃₋₃₀ cycloalkyl, C₃₋₃₀ cycloalkenyl, C₄₋₃₀ cycloalkynyl, C₇₋₃₀ aralkyl, C₇₋₃₀ alkaryl and C₅₋₃₀ aryl, ~~preferably R³, R⁴ and R⁵ are independently selected from the group consisting of --H, C₁₋₁₅ alkyl, C₂₋₁₅ alkenyl, C₂₋₁₅ alkynyl, C₃₋₂₀ cycloalkyl, C₃₋₂₀ cycloalkenyl, C₄₋₂₀ cycloalkynyl, C₇₋₂₀ aralkyl, C₇₋₂₀ alkaryl and C₆₋₂₀ aryl, more preferably R³, R⁴ and R⁵ are independently selected from the group consisting of --H, straight chain C₁₋₁₀ alkyl, C₂₋₁₀ alkenyl and C₆₋₁₂ aryl, most preferably, R³, R⁴ and R⁵ are independently selected from the group consisting of H,~~

~~methyl, ethyl, propyl, butyl, hexyl, cyclohexyl, octyl, nonyl, dodecyl, eicosyl, norbornyl, adamantly, vinyl, propenyl, cyclohexenyl, benzyl, phenylethyl, phenylpropyl, phenyl, tolyl, dimethylphenyl, trimethylphenyl, ethylphenyl, propylphenyl, biphenyl, naphthyl, methylnaphthyl, anthryl, phenanthryl, benzylphenyl, pyrenyl, acenaphthyl, phenalenyl, aceanthrylenyl, tetrahydronaphthyl, indanyl, biphenyl, particularly methyl, ethyl, propyl and isopropyl.~~

20. (Currently amended) The compound according to claim ~~19~~ 2, wherein the polysaccharide, P, comprises $10^{-1} \times 10^5$ monosaccharide moieties.

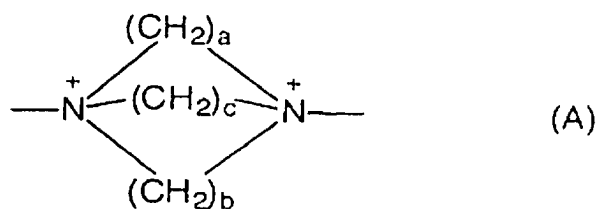
21. (Previously presented) The compound according to claim 20, wherein V comprises a positively charged moiety comprising one or two positively charged nitrogen atoms, one or two positively charged phosphorous atoms, one or two positively charged sulfur atoms, or mixtures thereof.

22. (Previously presented) The compound according to claim 21, wherein V comprises a singly charged quaternary ammonium, quaternary phosphonium or sulfonium group, having the formula $^{+}\text{--NR}^6_2\text{--}$, $^{+}\text{--PR}^7_2\text{--}$, or $^{+}\text{--SR}^8\text{--}$, respectively, wherein R^6 , R^7 and R^8 are independently selected from the group consisting of H and monovalent hydrocarbon radicals.

23. (Currently amended) A compound according to claim 22, wherein R^6 , R^7 and R^8 are independently selected from the group consisting of --H, C_{1-20} alkyl, C_{2-20} alkenyl, C_{2-20} alkynyl, C_{3-30} cycloalkyl, C_{3-30} cycloalkenyl, C_{4-30} cycloalkynyl, C_{7-30} aralkyl, C_{7-30} alkaryl and C_{5-30} aryl, preferably R^6 , R^7 and R^8 are independently selected from the group consisting of --H, C_{1-15} alkyl, C_{2-15} alkenyl, C_{2-15} alkynyl, C_{3-20} cycloalkyl, C_{3-20} cycloalkenyl, C_{4-20} cycloalkynyl, C_{7-20} aralkyl, C_{7-20} alkaryl and C_{6-20} aryl, more preferably R^6 , R^7 and R^8 are independently selected from the group consisting of --H, straight chain C_{1-10} alkyl, C_{2-10} alkenyl and C_{6-12} aryl, most preferably, R^6 , R^7 and R^8 are independently selected from the group consisting of methyl, ethyl, propyl, butyl, hexyl, cyclohexyl, octyl, nonyl, dodecyl, eicosyl, norbornyl and adamantly, vinyl, propenyl, cyclohexenyl, benzyl, phenylethyl, phenylpropyl, phenyl, tolyl, dimethylphenyl,

~~trimethylphenyl, ethylphenyl, propylphenyl, biphenyl, naphthyl, methylnaphthyl, anthryl, phenanthryl, benzylphenyl, pyrenyl, acenaphthyl, phenalenyl, aceanthrylenyl, tetrahydronaphthyl, indanyl, biphenylyl, particularly methyl, ethyl, propyl and isopropyl.~~

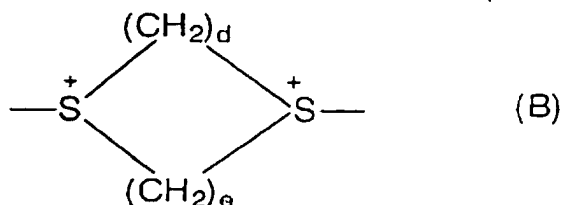
24. (Previously presented) The compound according to claim 22, wherein V comprises two positively charged nitrogen atoms, preferably $--^+NR^6_2--R^9--NR^6_2^+--$ or a group (A):



wherein a, b and c independently represent 1-10, preferably, 1-5, more preferably 1-3, most preferably 2, and wherein R^9 is selected from the group consisting of C_{1-20} alkanediyl, C_{2-20} alkenediyl, C_{2-20} alkynediyl, C_{3-30} cycloalkanediyl, C_{3-30} cycloalkenediyl, C_{5-30} cycloalkynediyl, C_{7-30} aralkylenediyl, C_{7-30} alkarylenediyl and C_{5-30} arylenediyl, preferably R^9 is selected from the group consisting of C_{1-16} alkanediyl, C_{2-16} alkenediyl, C_{2-16} alkynediyl, C_{4-20} cycloalkanediyl, C_{4-20} cycloalkenediyl, C_{5-20} cycloalkynediyl, C_{7-20} aralkylenediyl, C_{7-20} alkarylenediyl and C_{6-20} arylenediyl, more preferably R^9 is selected from the group consisting of straight chain C_{1-16} alkanediyl, C_{2-16} alkenediyl, C_{6-16} aralkylenediyl and C_{6-16} alkarylenediyl, most preferably, R^9 is selected from methylene, 1,2-ethylene, 1,2-propylene, 1,3-propylene, 1,2-butylene, 1,3-butylene, 1,4-butylene, 1,5-pentylene, 1,6-hexylene, 1,8-octylene, 1,10-decylene and 1,12-dodecylene.

25. (Original) The compound according to claim 24, wherein (A) is 1,4-diazoniabicyclo[2.2.2]octane.

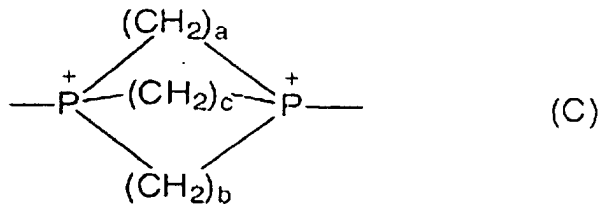
26. (Previously presented) The compound according to claim 22, wherein V comprises two positively charged sulfur atoms, preferably $--^+SR^8--R^{10}--SR^8^+--$ or a group (B)



wherein d and e independently represent 1-10, preferably, 1-5, more preferably 1-3, most preferably 2, and wherein R¹⁰ is selected from the group consisting of C₁₋₂₀ alkanediyl, C₂₋₂₀ alkenediyl, C₂₋₂₀ alkynediyl, C₃₋₃₀ cycloalkanediyl, C₃₋₃₀ cycloalkenediyl, C₅₋₃₀ cycloalkynediyl, C₇₋₃₀ aralkylenediyl, C₇₋₃₀ alkarylenediyl and C₅₋₃₀ arylenediyl, preferably R¹⁰ is selected from the group consisting of C₁₋₁₆ alkanediyl, C₂₋₁₆ alkenediyl, C₂₋₁₆ alkynediyl, C₄₋₂₀ cycloalkanediyl, C₄₋₂₀ cycloalkenediyl, C₅₋₂₀ cycloalkynediyl, C₇₋₂₀ aralkylenediyl, C₇₋₂₀ alkarylenediyl and C₆₋₂₀ arylenediyl, more preferably R¹⁰ is selected from the group consisting of straight chain C₁₋₁₆ alkanediyl, C₂₋₁₆ alkenediyl, C₆₋₁₆ aralkylenediyl and C₆₋₁₆ alkarylenediyl, most preferably, R¹⁰ is selected from methylene, 1,2-ethylene, 1,2-propylene, 1,3-propylene, 1,2-butylene, 1,3-butylene, 1,4-butylene, 1,5-pentylene, 1,6-hexylene, 1,8-octylene, 1,10-decylene and 1,12-dodecylene.

27. (Original) A compound according to claim 26, wherein (B) is 1,4-dithioniumcyclohexane.

28. (Previously presented) The compound according to claim 22, wherein V comprises two positively charged phosphorus atoms, preferably --⁺PR₂--R⁹--PR₂⁺-- or a group (C)

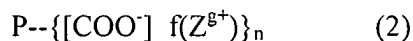


wherein a, b and c independently represent 1-10, preferably, 1-5, more preferably 1-3, most preferably 2, and wherein R⁹ is selected from the group consisting of C₁₋₂₀ alkanediyl, C₂₋₂₀ alkenediyl, C₂₋₂₀ alkynediyl, C₃₋₃₀ cycloalkanediyl, C₃₋₃₀ cycloalkenediyl, C₅₋₃₀ cycloalkynediyl,

C₇₋₃₀ aralkylenediyl, C₇₋₃₀ alkarylenediyl and C₅₋₃₀ arylenediyl, preferably R⁹ is selected from the group consisting of C₁₋₁₆ alkanediyl, C₂₋₁₆ alkenediyl, C₂₋₁₆ alkynediyl, C₄₋₂₀ cycloalkanediyl, C₄₋₂₀ cycloalkenediyl, C₅₋₂₀ cycloalkynediyl, C₇₋₂₀ aralkylenediyl, C₇₋₂₀ alkarylenediyl and C₆₋₂₀ arylenediyl, more preferably R⁹ is selected from the group consisting of straight chain C₁₋₁₆ alkanediyl, C₂₋₁₆ alkenediyl, C₆₋₁₆ aralkylenediyl and C₆₋₁₆ alkarylenediyl, most preferably, R⁹ is selected from methylene, 1,2-ethylene, 1,2-propylene, 1,3-propylene, 1,2-butylene, 1,3-butylene, 1,4-butylene, 1,5-pentylene, 1,6-hexylene, 1,8-octylene, 1,10-decylene and 1,12-dodecylene.

29. (Original) A compound according to claim 28, wherein (C) is 1,4-diphosphoniabicyclo[2.2.2]octane.

30. (Original) A process for the preparation of a compound having formula (1), comprising reacting a compound having the formula (2):



wherein:

P is as defined in any preceding claim;

n is as defined in any preceding claim;

Z is a cation;

f represents 1/g; and

g represents 1, 2, 3, 4, 5 or 6;

with a group having the formula (3)



wherein X is as defined in any preceding claim; and,

L is a leaving group.

31. (Currently amended) A process according to claim 30 wherein L is selected from the group consisting of N-hydroxysuccinimide, N-hydroxybenzotriazole, nitrate, sulfate, bisulfate, phosphate (mono-, bi-, or triphosphate), carbonate, bicarbonate, acetate, tosylates, mesylates, brosylates, and halides including chloride, bromide, and iodide, preferably tosylate.

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Response to Office Action mailed August 9, 2010
Response dated December 9, 2010

32. – 39. (Canceled)